

What is claimed is:

1. A method of forming a contact in a semiconductor device, comprising:
forming an insulating layer on a semiconductor substrate;
5 forming a contact hole in the insulating layer by selectively etching a portion
of the insulating layer;
forming a barrier metal layer having a uniform thickness on the insulating
layer and a surface of the contact hole;
forming a wetting layer of an oxidation-resistive metal material on the barrier
10 metal layer; and
forming a metal layer on the wetting layer so as to fill the contact hole.
2. The method of forming a contact in a semiconductor as claimed in
claim 1, wherein the oxidation-resistive metal material includes tungsten.
- 15 3. The method of forming a contact in a semiconductor as claimed in
claim 1, wherein the wetting layer is formed by a chemical vapor deposition (CVD)
process or an atomic layer deposition (ALD) process.
- 20 4. The method of forming a contact in a semiconductor as claimed in
claim 1, wherein the wetting layer is formed at a temperature of about 350°C to
about 550°C.
5. The method of forming a contact in a semiconductor as claimed in
25 claim 1, wherein the wetting layer is formed to a thickness of about 10Å to about

1000Å.

6. The method of forming a contact in a semiconductor as claimed in claim 1, wherein the wetting layer is formed to such a thickness that sufficient space
5 remains in the contact hole for the metal layer.

7. The method of forming a contact in a semiconductor as claimed in claim 1, wherein the barrier metal layer includes a titanium layer, a titanium nitride layer or a composite layer thereof.

10 8. The method of forming a contact in a semiconductor as claimed in claim 7, wherein the barrier metal layer is formed by a physical vapor deposition (PVD) process, a chemical vapor deposition (CVD) process, or an atomic layer deposition (ALD) process.

15 9. The method of forming a contact in a semiconductor as claimed in claim 1, wherein the barrier metal layer is formed to such a thickness that sufficient space remains in the contact hole for the wetting layer and the metal layer.

20 10. The method of forming a contact in a semiconductor as claimed in claim 1, wherein the metal layer is formed by:
depositing a metal material on the wetting layer to such a thickness that the contact hole is partially filled; and
re-flowing the deposited metal material to completely fill the contact hole.

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11. The method of forming a contact in a semiconductor as claimed in claim 10, wherein the metal material is deposited through a chemical vapor deposition (CVD) process or a physical vapor deposition (PVD) process.

5 12. The method of forming a contact in a semiconductor as claimed in claim 1, wherein the metal layer is formed by:

depositing a first metal material on the wetting layer by a chemical vapor deposition (CVD) process to such a thickness that the contact hole is partially filled with the first metal material;

10 depositing a second metal material on the first metal material by a physical vapor deposition (PVD) process; and

re-flowing the first metal material and the second metal material to completely fill the contact hole.

15 13. The method of forming a contact in a semiconductor as claimed in claim 12, wherein the first metal material is the same as the second metal material.

14. The method of forming a contact in a semiconductor as claimed in claim 1, wherein the metal layer includes aluminum or an aluminum alloy.

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